

Are there Differences in Weight Loss Outcomes among Participants with and without a Disability in an Adapted Version of the Diabetes Prevention Program (DPP)?

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Background

- 29.1 million people (9.3%) of the U.S. population had diabetes in 2012.¹
- 7.7% of Montana residents aged ≥18 years had diabetes and an estimated 6.8% had pre-diabetes in 2013.²
- 24.1% of Montana adults reported having disability in 2013. Of those 21.6% were overweight or obese and 15.4% had diabetes.²
- Few studies evaluated delivery of lifestyle interventions promoting weight loss targeting people with disabilities.

Research Objective

- To compare participation, cardiometabolic risk factors, self-monitoring behaviors, and weight loss outcomes in people with disabilities and without disabilities at high-risk for cardiovascular disease (CVD) and type 2 diabetes enrolled in an adapted DPP lifestyle intervention.

Methods

Intervention Sites and Intervention Design: The Montana DPHHS began implementing the DPP at 4 health care facilities in 2008 and had expanded to 18 sites by 2013.

Lifestyle Coaches: Trained health professionals (RN, RD, CDE, PT).

Intervention: 10-month intensive lifestyle intervention; 16 weekly core sessions followed by 6 monthly post-core sessions.

Curriculum: CDC National DPP curriculum. Sessions include healthy eating, physical activity, and problem solving.³

Participant Program Goals: Self-monitor dietary intake and physical activity, decrease fat gram intake, increase moderately intense physical activity to ≥150 min/week, and achieve 7% weight loss.

Disability Status: In 2012, the MT DPP added four disability questions to the data collection system. Those questions were adapted from the U.S. Census Bureau's American Community Survey and include:

- Are you deaf or do you have serious difficulty hearing?
- Are you blind or do you have serious difficulty seeing, even when wearing glasses?
- Do you have serious difficulty walking or climbing stairs?
- Because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions?

Participant Eligibility Criteria: Aged 18 years and older, BMI ≥25.0 kg/m², plus one or more of the following risk factors for CVD and type 2 diabetes:

- Diagnosis of prediabetes, IGT, OR IFG
- A1C between 5.7% and 6.4%
- Blood pressure ≥130/85 mmHg or treatment
- Dyslipidemia: triglycerides ≥150 mg/d, LDL cholesterol >130mg/dl or treatment, HDL cholesterol <40mg/dl for men or <50mg/dl for women
- History of gestational diabetes mellitus or gave birth to a baby >9 lbs.

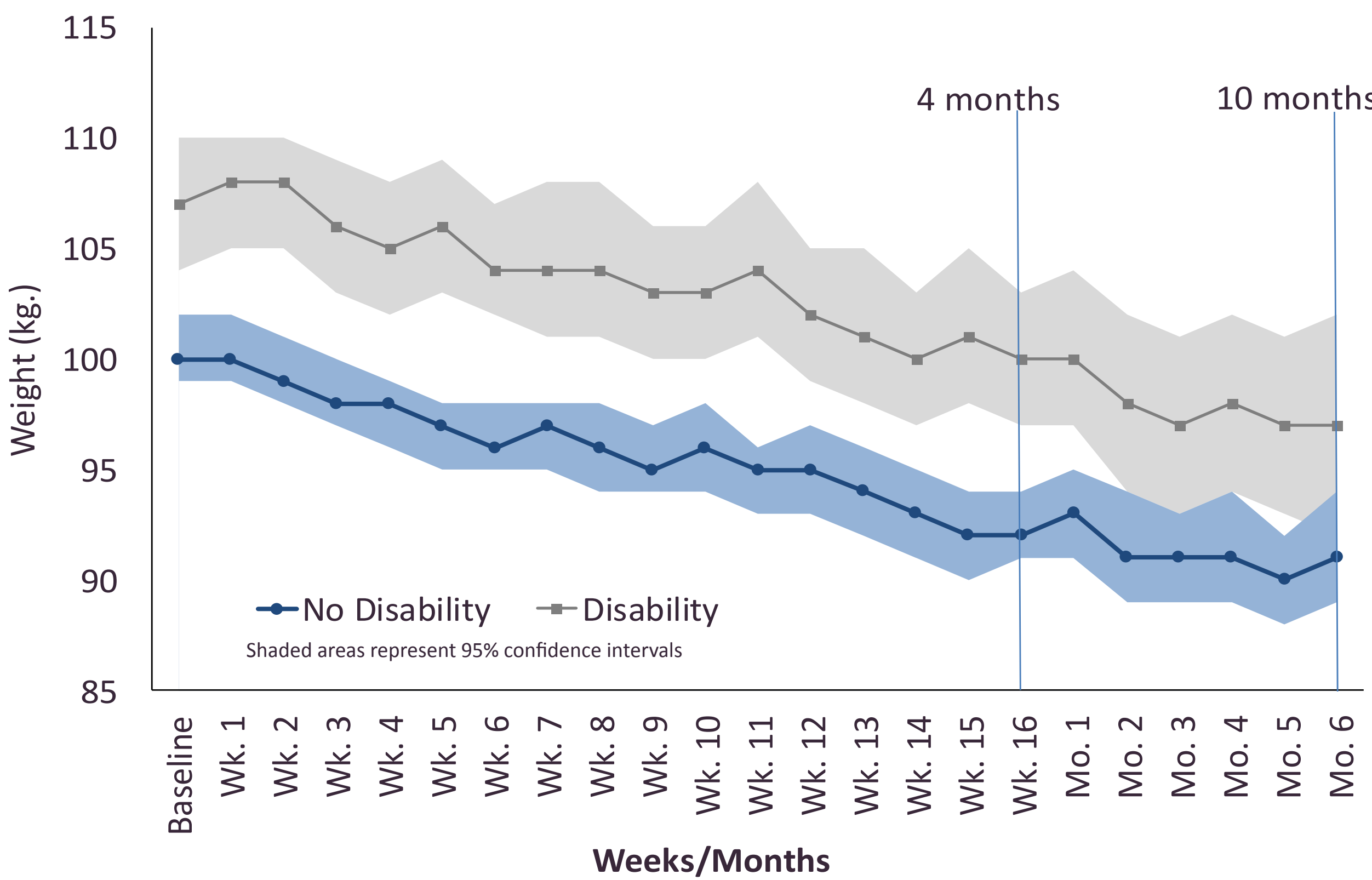
Data Source: Montana DPP, 2012-2013.

Inclusion Criteria: Participants from 18 DPP sites who attended ≥1 sessions. 350 participants with disability and 884 participants without disability (N=1,234).

Analysis: Multivariable logistic regression models to assess the odds ratios of 5% weight loss and 7% weight loss goal. Independent t-tests for continuous data and chi-square tests for categorical data were used to compare the baseline characteristics between the two groups. Intention-to-treat analyses were performed using the last observed weight of participants enrolled in the program to calculate mean weight loss.

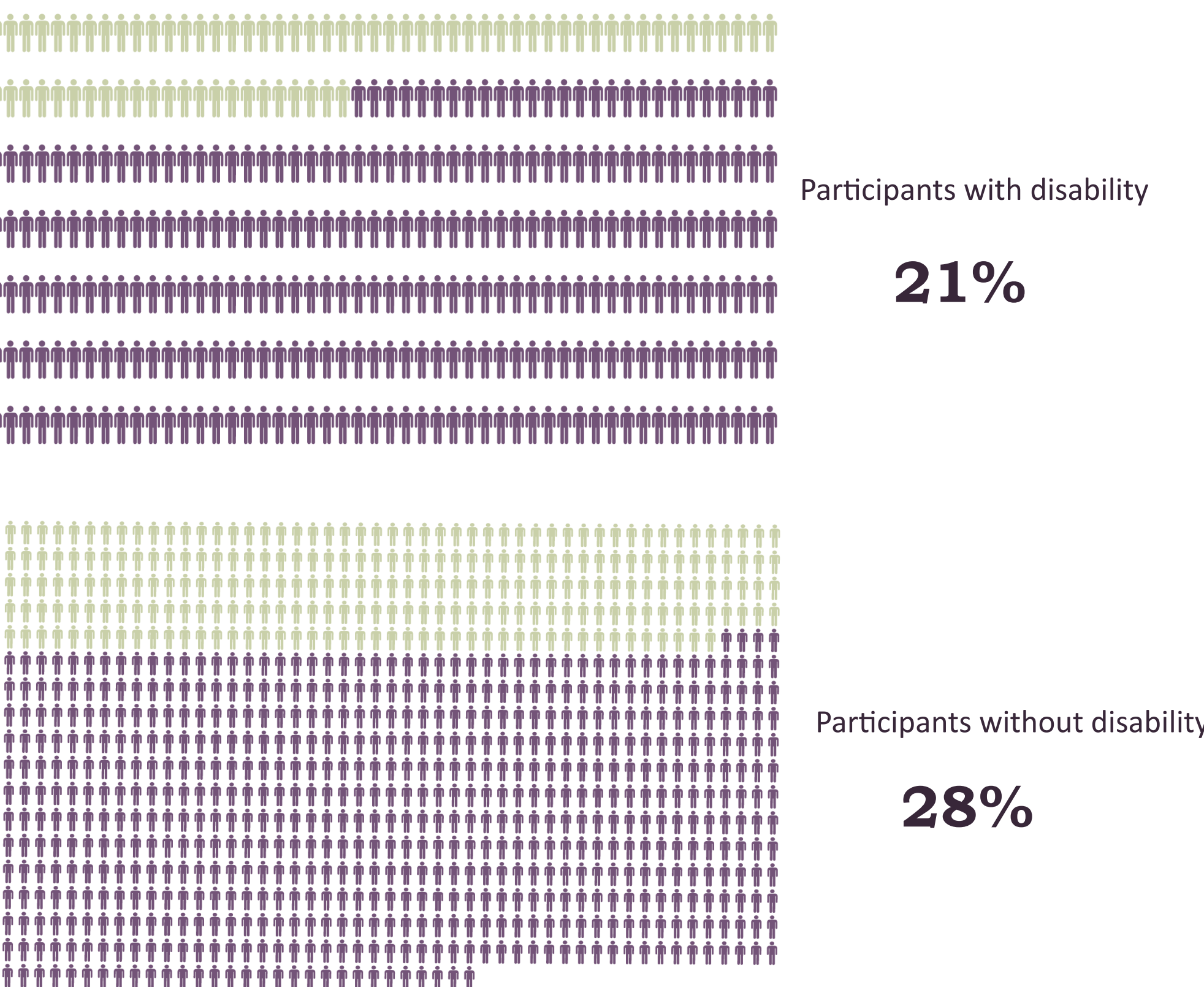
WEIGHT LOSS OVER 10 MONTH PERIOD

Mean weight loss was significantly higher for participants without disability; however, both groups lost weight over the 10 month period.



ACHIEVED 7% WEIGHT LOSS GOAL AT CORE (4 MONTHS)

Participants met goal (green icon) Participants did not meet goal (purple icon)



CARDIOMETABOLIC RISK FACTORS: BASELINE AND POST-CORE (10 MONTHS)

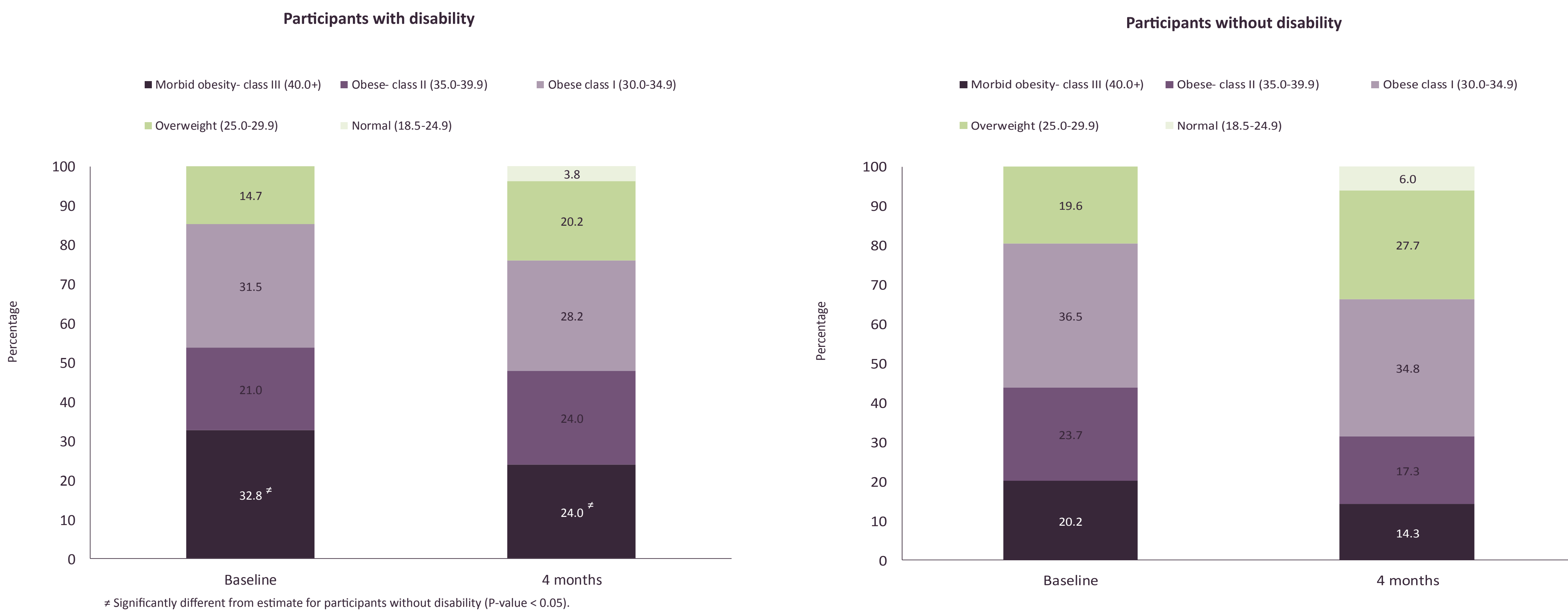
Fasting blood glucose, triglycerides, and systolic blood pressure improved significantly for people without disability; whereas, total cholesterol improved significantly for people with disability. Low-density lipoprotein decreased significantly over time in both groups.

Participants with disability							Participants without disability						
Normal Values	Baseline		10 months		Mean difference (10 months-baseline)	P*	Normal Values	Baseline		10 months		Mean difference (10 months-baseline)	P*
	Mean	SD	Mean	SD				Mean	SD	Mean	SD		
Fasting blood glucose (<100 mg/dL)	90.1	6.6	89.0	8.2	-1.1	0.1370	Fasting blood glucose (<100 mg/dL)	91.1	6.6	89.8	6.9	-1.3	0.0220
Triglycerides (<150 mg/dL)	102.4	28.6	99.6	24.2	-2.8	0.3240	Triglycerides (<150 mg/dL)	104.5	26.4	100.8	26.5	-3.7	0.0210
HDL cholesterol (men >50 mg/dL, women >60 mg/dL)	63.7	4.6	61.5	3.9	-2.2	0.8392	HDL cholesterol (men >50 mg/dL, women >60 mg/dL)	62.7	5.2	65.0	7.3	2.3	0.9655
LDL cholesterol (<130 mg/dL)	96.4	19.5	90.7	19.8	-5.7	<.0001	LDL cholesterol (<130 mg/dL)	99.7	18.5	98.1	19.5	-1.6	<.0001
Total cholesterol (<200 mg/dL)	170.9	19.2	164.7	22.1	-6.2	0.0187	Total cholesterol (<200 mg/dL)	171.5	18.0	170.9	18.8	-0.6	0.1508
SBP (<150 mmHg)	120.6	10.1	121.4	10.1	0.8	0.8817	SBP (<150 mmHg)	123.4	9.1	121.0	10.2	-2.4	0.0025
DBP (<90 mmHg)	75.9	7.7	76.5	7.5	0.6	0.5167	DBP (<90 mmHg)	77.9	7.7	77.1	7.3	-0.8	0.2780

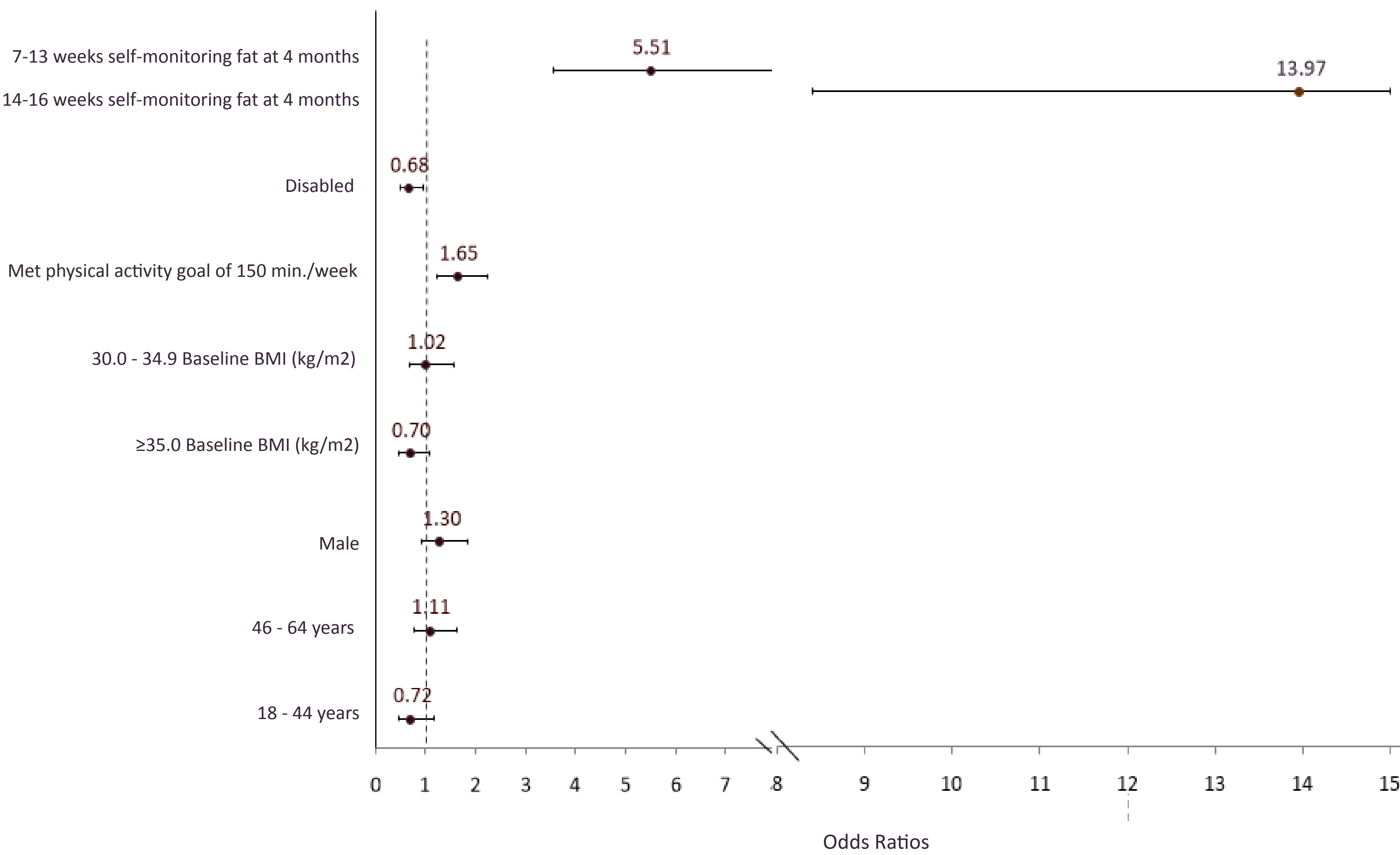
*Paired t-test. (P-value ≤0.05)

BODY MASS INDEX (BMI): PERCENTAGE CHANGE IN DISTRIBUTION OF PARTICIPANTS OVER TIME, BASELINE AND CORE (4 MONTHS)

4% of adults in the disability group, and 6% of adults in the non-disability group who were previously overweight or obese achieved normal weight at 4 months.



MULTIVARIABLE ANALYSIS: ODDS OF ACHIEVING 7% WEIGHT LOSS GOAL AT CORE (4 MONTHS)



Among participants with disability, the odds of achieving the 7% weight loss goal were lower compared to those without disability.

A person was 5.51 time more likely to achieve the 7% weight loss goal if s/he self-monitored fat intake for ≥ 7weeks, and 1.65 time more likely to achieve the weight goal if they met a ≥150 min./week of physical activity.

Summary of Findings

- The Montana DPP enrolled 350 participants with disability and 884 participants without disability from 2012 through 2013.
- Participants with disability were older and had a higher BMI at baseline. They were also less likely to achieve the 7% weight loss goal at 4 months compared to those without a disability.
- Self-monitoring fat and meeting the physical activity goal are significant factors for meeting the 7% weight loss goal.
- Adaptation in the DPP may be necessary to support weight loss outcomes among persons with disability.
- Adults with disability can successfully participate in a community based setting DPP. Furthermore, they can improve their lifestyles to prevent and minimize their cardiometabolic risk factors for developing type 2 diabetes.

Limitations

- Small sample size for disability cohort.
- Males were underrepresented in both cohorts.
- Self-reported disability status, physical activity and self-monitoring fat intake.
- Non-randomized study.

References

- National Health and Nutrition Examination Survey, 2012.
- Behavioral Risk Factor Surveillance System, 2013.
- DPP Research Group. *Diabetes Care* 2002;25:2165-71.